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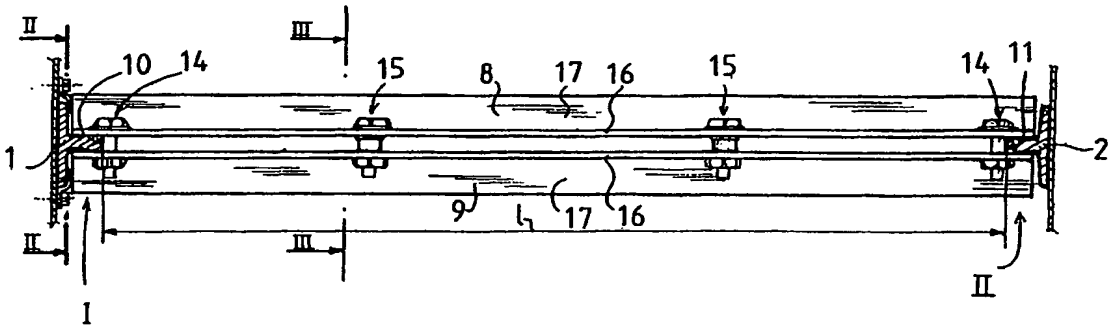

(57) Abstract

Device and method for mounting the guide rails of a pair of elevator and/or counterweight guide rails in pairs in a vertical orientation so that the guide rails are at a distance from and parallel to each other. The device comprises two adjacent bars (8, 9) having a first end (I) and a second end (II); a first stop piece (10) at the first end of the bar (8, 9) and a second stop piece (11) at the second end of the bar (8, 9), the distance (1) between said first and second stop pieces being so fitted that it corresponds to the desired distance between the front surfaces (7) of the guide rails (1, 2) so that, when the device is placed between the guide rails with the stop pieces against the guide rail front surfaces, the stop pieces determine the exact distance between the guide rails. Each one of the bars has near its first and second ends side stop faces (12, 13) which in the adjacent bars are parallel to each other and facing toward each other, and adjustment elements (14, 15) connected to the bars to allow the bars to be moved toward each other so that the side stop faces (12, 13) of the bars (8, 9) can be pressed against the lateral guide surfaces (5, 6) of the guide rails (1, 2) from opposite sides of the guide flange (4).

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DEVICE AND METHOD FOR THE INSTALLATION OF GUIDE RAILS

The present invention relates to a device as defined in the preamble of claim 1. Moreover, the invention relates to a method as defined in the preamble of claim 15. In addition, the invention relates to a method as defined in the preamble of claim 16.

In prior art, various devices for mounting the guide rails in a pair of elevator and/or counterweight guide rails at a distance from each other in a vertical position and in parallel directions relative to each other are known e.g. from specifications JP 9208152 A, JP 9040230 A, JP 9048569 A, JP 9071374 A And JP 9202564 A. The perpendicularity of the guide rails is verified by means of plummets. The devices are provided with numerous adjusting elements by means of which the position of the guide rails can be adjusted in relation to each other and the plummets.

A problem with the prior-art devices is that their use necessitates the suspension of several plummets in the elevator shaft. A further problem is that the devices are complicated and expensive, due to their many adjustment elements. In addition, the installation personnel must have special skills to be able to use them.

The object of the invention is to eliminate the problems mentioned above.

A specific object of the invention is to disclose a cheap and simple tool which will make it simple and easy to install guide rails in a perpendicular upright position in an elevator shaft.

The device of the invention is characterized by what is presented in claim 1.

The method of the invention is characterized by what is presented in claim 15.

The method of the invention is characterized by what is presented in claim 16.

According to the invention, the device comprises two adjacent parallel bars, each having a first end and a second end. The first end of the bar is provided with a first stop piece and the second end with a second stop piece. The distance between the first and second stop pieces has been so fitted that it corresponds to the desired distance between the front surfaces of the guide rails so that, when the device is placed between the guide rails with the stop pieces against the guide rail front surfaces, the stop pieces determine the exact distance between the guide rails. Each one of the bars has near its first and second ends side stop faces which in the adjacent bars are parallel to each other and facing toward each other, and adjustment elements connected to the bars to allow the bars to be moved toward each other so that the side stop faces of the bars can be pressed against the lateral guide surfaces of the guide rails from opposite sides of the guide flange to fasten the device to the guide rails.

In the method of the invention, the above-mentioned device can be used as follows. First, the first rail of the guide rail pair is adjusted into a vertical position using a plumb line fitted close to the rail. Next, the first guide rail is fastened by its mounting flange to a fixed structure. After that, the device is placed in a horizontal position between the guide rails so that the sop piece at the first end of the

device lies against the front surface of the first guide rail. The side stop surfaces at the first end of the device are pressed tightly against the lateral guide surfaces of the first guide rail so that the device is fastened in a horizontal position to the first guide rail. The front surface of the second guide rail of the guide rail pair is set against the stop piece at the second end of the device, the distance between the stop pieces thus determining the distance between the guide rails. Next, the side stop surfaces at the second end of the device are pressed tightly against the lateral guide surfaces of the second guide rail so that the second end of the device is fastened to the second guide rail, thus aligning the second guide rail in a direction parallel to the first guide rail. The second guide rail is fastened by a point near the device to a fixed structure. The pressure holding the device pressed against the guide rails is then eased so as to leave a sliding clearance between the side stop surfaces of the device and the lateral guide surfaces of the guide rails. The device is then slid along the guide rails in a horizontal position to a level near the next point of attachment, where the above-described steps are repeated.

Further, according to the invention, the above-described device can also be used as follows. First, the device is placed in a horizontal position between the guide rails so that the stop piece at the first end of the device lies against the front surface of the first guide rail. Next, the side stop surfaces at the first end of the device are pressed tightly against the lateral guide surfaces of the first guide rail so that the device is fastened in a horizontal position to the first guide rail. After that, the front surface of the second guide rail of the guide rail pair is set against the stop piece at the second

end of the device. The side stop surfaces at the second end of the device are pressed tightly against the lateral guide surfaces of the second guide rail so that the second end of the device is fastened to the second guide rail, thus aligning the second guide rail in a direction parallel to the first guide rail. The assembly formed by the pair of guide rails fastened together by the device is aligned by means of two plumb lines fitted near the assembly at a distance from each other. The first guide rail and the second guide rail are then fastened by their mounting flanges to a fixed structure. The pressure holding the device pressed against the guide rails is eased so as to leave a sliding clearance between the side stop surfaces of the device and the lateral guide surfaces of the guide rails. The device is slid along the guide rails in a horizontal position to a level near the next point of attachment, where the above-described steps are repeated.

The invention provides the advantage that the device is as simple and cheap a possible and its use is fast, easy and simple and does not require any special skills of the installing personnel. Having been fastened to the first guide rail, the device automatically aligns the second guide rail parallel to the first guide rail and holds it at an exact predetermined distance from it, utilizing the precisely machined lateral guide surfaces and front surface of the guide rail. As the device does not comprise many adjustment elements, there is no risk that their incorrect adjustments and clearances might impair the accuracy of the installation. The device is well suited for installation without scaffolding, in which case the device is kept in a horizontal position and moved vertically on a horizontal mounting platform movable

in the vertical direction in the shaft by means of the elevator machine.

In an embodiment of the device, the bars are profiled beams having a first flange, which comprises the above-mentioned side stop surface, and a second flange, which is oriented at an angle, preferably a right angle, to the first flange. The first flanges of the bars are parallel to each other while the second flanges are oriented in opposite directions.

In an embodiment of the device, the bars comprise a first bar and a second bar. The adjustment elements comprise a threaded bolt fastened to the first flange of the first bar, a hole provided in the first flange of the second bar for receiving the threaded bolt through the hole, and a nut fitted to the threaded bolt and against the first flange of the second bar so that the distance between the first and second bars can be adjusted by turning the nut on the threaded bolt.

In an embodiment of the device, the stop pieces consist of threaded bolts placed near the first and second ends of the device.

In an embodiment of the device, the adjustment elements comprise an adapter element which is attached to the first flange of the first and/or second bar to determine a minimum distance between the side stop surfaces of the first and second bars.

In an embodiment of the device, the adapter element has been so fitted that the clearance formed by the minimum distance between the side stop surfaces of the first and second bars corresponds to the thickness of the guide flange in the area of the lateral guide sur-

faces, so that, when the gap between the bars has been adjusted to a size corresponding to the minimum distance determined by the adapter element, the device can be slid along the guide rails.

In an embodiment of the device, the adapter element is a sleeve placed around the threaded bolt, preferably fastened to the first flange of the first bar.

In an embodiment of the device, the adapter elements are located about the middle part of the bars, at a distance from the ends, so that the side stop surfaces of the bars can be pressed against the guide surfaces of the guide rails.

In an embodiment of the device, the bar is a profiled bar with an L-shaped cross-section.

In an embodiment of the device, the device comprises an alignment device for the alignment of the device with respect to the plumb line/lines.

In an embodiment of the device, the alignment device and the bar comprise fastening elements to allow the alignment device to be detachably fastened to the bar.

In an embodiment of the device, the alignment device comprises a directive member having a straight edge to be placed against the free straight edge of the second flange of a bar; and an alignment bar attached to the directive member and extending to a distance from the bars in a direction substantially perpendicular to the longitudinal direction of the bars, said alignment bar being provided with an alignment mark, such as a notch, groove, line or the like, to allow the device to be aligned with respect to a plumb line.

In an embodiment of the device, the front surface of the guide rail is provided with a groove oriented in the longitudinal direction of the guide rail. The device comprises a pointed element located between the bars close to the end of the device and having a point shaped in a fashion corresponding to the cross-sectional form of the groove.

In an embodiment of the device, the pointed element comprises two parallel stop faces facing in opposite directions, the distance between said stop faces, i.e. the thickness of the pointed element, substantially corresponding to the distance between the lateral guide surfaces of the guide rail, so that when the side stop surfaces of the bars are pressed against the stop faces of the pointed element, they fasten the pointed element to the device.

In the following, the invention will be described in detail by the aid of a few embodiments with reference to the drawings, wherein

Fig. 1 presents an embodiment of the device of the invention, mounted between guide rails,

Fig. 2 presents section II-II of Fig. 1,

Fig. 3 presents section III-III of Fig. 1,

Fig. 4 presents the guide rail and device in Fig. 1 in separation from each other,

Fig. 5 presents another embodiment of the device of the invention,

Fig. 6 presents the device in Fig. 5 as seen from the direction VI-VI, and

Fig. 7 presents a third embodiment of the device of the invention, and

Fig. 8 presents the device in Fig. 6 as seen from the direction VIII-VIII.

Fig. 1 presents a device for mounting the guide rails 1, 2 of a pair of elevator and/or counterweight guide rails at an exact predetermined distance from each other so that they are precisely vertical and parallel to each other. The fixed structure to which the guide rails are fastened may be e.g. a wall of the elevator shaft or a beam structure fixedly attached to a wall of the elevator shaft.

As can be best seen from Fig. 4, the T-shaped guide rail 1, 2 comprises a mounting flange 3 for attachment to a fixed structure and a guide flange 4 having two longitudinal lateral guide surfaces 5, 6 facing in opposite lateral directions and a front surface 7 at the free end of the guide flange 4, extending between the lateral guide surfaces 5, 6 at right angles to these. The lateral guide surfaces 5 and 6 are machined surfaces, so they are substantially parallel to each other and they can be used as guide surfaces which automatically bring the device described below to the right position. The front surface 7 of the guide rail is also a machined surface, so it can be utilized in the determination of the exact distance between the guide rails 1, 2 in the guide rail pair.

As shown in Fig. 1, the device comprises two adjacent parallel bars 8, 9. The bars 8 and 9 are rigid, straight profiled bars made of metal, e.g. steel, and having an L-shaped cross-section. As shown in Fig. 2 and 3, the bars 8, 9 comprise a first flange 16 and a

second flange 17, which are at right angles to each other. The bars 8, 9 are placed side by side in the device so that the first flanges 16 are parallel to each other while the second flanges 17 are directed away from each other.

In the following, the left-hand end of the device in Fig. 1 is called the first end I and the right-hand end is called the second end II. At the first end I there is a first stop piece 10 and at the second end II a second stop piece 11. The distance l between the first stop piece 10 and the second stop piece 11 has been so fitted that it corresponds to the desired distance between the front surfaces 7 of the guide rails 1, 2. When the device is placed between the guide rails 1, 2 in a horizontal position as in Fig. 1 so that the stop pieces 10, 11 are touching the front surfaces 7 of the guide rails 1, 2, the stop pieces determine the exact distance between the guide rails 1, 2. Each one of the bars 8, 9 has side stop surfaces 12, 13 near its first and second ends. In the adjacent bars, these side stop surfaces are parallel to and facing toward each other. The side stop surfaces 12, 13 are those surfaces of the first flanges 16 of the adjacent bars 8, 9 which face toward each other. The bars 8, 9 are connected together with adjusting elements 14, 15, by means of which the bars 8, 9 can be moved toward each other and further apart from each other so that side stop surfaces 12, 13 of the bars 8, 9 can be pressed against the lateral guide surfaces 5, 6 of the guide rails 1, 2 from opposite sides of the guide flange 4.

Each one of the adjusting elements 14, 15 comprises a threaded bolt 18 welded to the first flange 16 of the first bar 8. The first flange 16 of the second bar 9 is provided with a through hole 19 located in a place

corresponding to the threaded bolt 18 and designed to receive the threaded bolt so that its end extends to the other side of the flange, allowing a nut 20 to be driven on it. By turning the nut 20, the distance between the bars 8, 9 can be adjusted.

The stop pieces 10, 11 mentioned in the examples presented in the figures consist of the threaded bolts 18 of the extreme adjusting elements 14, which are located near the first end I and second end II of the device. The extreme threaded bolts 18 are fitted at an exact distance from each other and, if necessary, welded onto the first flange 16 of the first bar 8. The stop pieces 10, 11 against which the front surfaces 7 of the guide rails are to be placed consist of the outer surface of the threaded bolt 18 between the opposite first flanges 16 of the first bar 8 and second bar 9.

The adjusting elements 15 about the middle portion of the device comprise an adapter element 32, which is a sleeve placed around the threaded bolt between the first bar 8 and the second bar 9 and welded onto the first flange 16 of the first bar 8. The function of the adapter sleeve 32 is to define the minimum distance between the side stop surfaces 12, 13. The adapter sleeve 32 has been so fitted that the minimum distance between the side stop surfaces 12, 13 of the first bar 8 and second bar 9 exceeds the thickness of the guide flange 3 in the area of the lateral guide surfaces 5, 6 by a small clearance. The adjusting elements 14 at the ends of the bars 8, 9 are not provided with an adapter sleeve. The side stop surfaces 12, 13 of the bars can be tightly pressed against the guide surfaces of the guide rails. When the adjusting elements 14 at the ends of the device are loosened, the adjusting elements 15 in the middle area of the device

still hold the bars together so that the lateral guide surfaces 5, 6 of the guide flange 4 remain separated from the side stop surfaces 12, 13 of the device by a small clearance which allows the device to be moved by sliding it along the lateral guide surfaces of the guide rail. In a preferred case, when threaded bolts 18 are used as stop pieces 10, 11, the contact area between the outer surface of the threaded bolt 18 and the front surface 7 of the guide rail is of a substantially linear shape, so the frictional resistance between them is small and constitutes no impediment to easy sliding of the device along the guide rails.

Fig. 5 and 6 present an embodiment which, in respect of structure and function, substantially corresponds to the embodiment in Fig. 1 except that it additionally comprises an alignment device 21, by means of which the device and the guide rails can be aligned in relation to plumb lines A, B. The alignment device 21 is detachably fastened to the second flange 17 of the second bar 9 via a through-bolt coupling 22 tightened with a winged nut. The alignment device 21 consists of two elongated plate-like bodies, a directive member 23 and an alignment bar 25, which are fixed to each other at right angles e.g. with two bolts or by welding. The directive member 23 comprises an elongated straight edge 24 which can be placed against the free straight edge of the second flange 17 of the bar 8, 9 so as to bring the alignment bar 25 into a position perpendicular to the longitudinal direction of the bars 8, 9. The alignment bar 25 is provided with a notch near its free end to allow the device to be aligned in relation to a plumb line. In the embodiment presented in Fig. 5 and 6, the same alignment device can be used at both ends I and II of the device for alignment of the device in relation to the plumb lines A and B disposed in their vicinity.

Fig. 7 and 8 present an embodiment of the device which, in respect of structure and function, substantially corresponds to the embodiment in Fig. 1 except that it additionally comprises a pointed element 28 between the bars 8,9, placed near the end I of the device. The pointed element 28 has a point 29 shaped in a fashion corresponding to the cross-sectional form of a groove 27 in the front surface 7 of the guide rail 1. The pointed element 28 comprises two parallel stop faces 30, 31 facing in opposite directions, the distance between them, i.e. the thickness of the pointed element substantially corresponding to the distance between the lateral guide surfaces 5, 6 of the guide rail 1, 2 so that, when the first flanges 16 of the bars 8, 9 are pressed against the stop faces 30, 31, they fasten the pointed element 28 to the device. In the figure, the point 29 has a wedge-shaped form and the groove 27 has a corresponding V-shaped cross-section. The point 29 pressed into the groove 27 facilitates the alignment of the device. The shapes of the point 29 and groove 27 may vary, depending on the case. The same pointed element 28 can be used at the second end II of the device as well.

The devices presented in Fig. 1, 5 and 7 can be used as follows. The first guide rail 1 of the guide rail pair is aligned vertically by using a plumb line (not shown) located near it. The first guide rail 1 is fastened by its mounting flange 3 to a fixed structure. A device as presented in Fig. 1 is placed in a horizontal position between the guide rails 1, 2 so that the stop piece 10, i.e. threaded bolt 18 at the first end I of the device lies against the front surface 7 of the first guide rail 1. The side stop surfaces 12, 13 at the first end I of the device are tightly pressed against the lateral guide surfaces 5, 6 of the first

guide rail 1, so that the device is held fast in a horizontal position on the guide rail 1. The front surface 7 of the second guide rail 2 is placed against the stop piece 10 at the second end II of the device, i.e. against the threaded bolt 18, the predetermined distance l between the stop pieces 10 and 11 thus determining the distance between the guide rails 1 and 2. The side stop surfaces 12, 13 at the second end II of the device are tightly pressed against the side stop surfaces 5, 6 of the second guide rail 2 so that the second end II of the device is fastened to the second guide rail 2. As the device is now oriented in exactly the direction determined by the lateral guide surfaces 5, 6 of the first guide rail 1, the side stop surfaces 12, 13 at the second end II of the device cause the lateral guide surfaces 5, 6 of the second guide rail 2 to be oriented in a direction parallel to the lateral guide surfaces 5, 6 of the first guide rail 1 and therefore parallel to the second guide rail 2. The second guide rail 2 is fastened to a fixed structure by a part near the device. After the guide rails 1, 2 have been fastened at that point, the pressure holding the device pressed against the guide rails is eased so as to leave a clearance between the side stop surfaces of the device and the lateral guide surfaces of the guide rails to permit sliding of the device. The device is then slid along the guide rails 1, 2 in a horizontal position, utilizing a mounting platform vertically movable in the elevator shaft, to a level near the next point of attachment. The above-described steps are repeated until the entire guide rail pair 1, 2 has been fastened to the fixed structure.

Correspondingly, the devices can also be used by performing the steps comprised in the method in a different order. It is also possible to fasten the device to

both guide rails 1, 2, whereupon this assembly can be aligned by means of plumb lines disposed near it, and only then fasten the guide rails to the fixed structure.

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined in the claims.

CLAIMS

1. Device for the installation of the guide rails (1, 2) of a pair of elevator and/or counterweight guide rails in pairs in a vertical orientation so that the guide rails are at a distance from and parallel to each other, each of said guide rails having a mounting flange (3) for attachment to a fixed structure and a guide flange (4) having two longitudinal lateral guide surfaces (5, 6) parallel to each other and facing in opposite lateral directions and a front surface (7) extending between the lateral guide surfaces, **characterized** in that the device comprises two adjacent parallel bars (8, 9), each having a first end (I) and a second end (II); a first stop piece (10) at the first end of the bar (8, 9) and a second stop piece (11) at the second end of the bar (8, 9), the distance (l) between said first and second stop pieces being so fitted that it corresponds to the desired distance between the front surfaces (7) of the guide rails (1, 2) so that, when the device is placed between the guide rails with the stop pieces against the guide rail front surfaces, the stop pieces determine the distance between the guide rails; and that each one of the bars has near its first and second ends side stop faces (12, 13) which in the adjacent bars are parallel to each other and facing toward each other, and adjustment elements (14, 15) connected to the bars to allow the bars to be moved toward each other so that the side stop faces (12, 13) of the bars (8, 9) can be pressed against the lateral guide surfaces (5, 6) of the guide rails (1, 2) from opposite sides of the guide flange (4).

2. Device as defined in claim 1, **characterized** in that the bars (8, 9) are profiled beams having a first flange (16), which comprises the above-mentioned side

stop surface (12, 13), and a second flange (17), which is oriented at an angle, preferably a right angle, to the first flange; and that the first flanges of the bars are parallel to each other while the second flanges are oriented in directions away from each other.

3. Device as defined in claim 2, **characterized** in that the bars comprise a first bar (8) and a second bar (9); and that the adjustment elements (14, 15) comprise a threaded bolt (18) fastened to the first flange (16) of the first bar (8), a hole (19) provided in the first flange (16) of the second bar (9) for receiving the threaded bolt through the hole, and a nut (20) fitted to the threaded bolt and against the first flange of the second bar so that the distance between the first and second bars can be adjusted by turning the nut on the threaded bolt.

4. Device as defined in claim 3, **characterized** in that the stop pieces (10, 11) consist of threaded bolts (18) disposed near the first end (I) and the second end (II) of the device.

5. Device as defined in claim 3 or 4, **characterized** in that the adjustment elements (15) comprise an adapter element (32) which is attached to the first flange (16) of the first bar (8) and/or second bar (9) to determine the minimum distance between the side stop surfaces (12, 13) of the first and second bars.

6. Device as defined in claim 4 or 5, **characterized** in that the adapter element (32) has been so fitted that the clearance formed by the minimum distance between the side stop surfaces (12, 13) of the first bar (8) and the second bar (9) corresponds to the thickness of the guide flange (4) in the area of the lateral guide

surfaces (5, 6), so that, when the gap between the bars has been adjusted to a size corresponding to the minimum distance determined by the adapter element, the device can be slid along the guide rails.

7. Device as defined in any one of claims 4 - 6, **characterized** in that the adapter element (32) is a sleeve placed around the threaded bolt (18), preferably fastened to the first flange (13) of the first bar (8).

8. Device as defined in any one of claims 1 - 7, **characterized** in that the adapter elements (32) are located in the middle area of the bars at a distance from the ends of the bars, so that the side stop surfaces (12, 13) of the bars can be pressed against the lateral guide surfaces (5, 6) of the guide rails (1, 2).

9. Device as defined in any one of claims 1 - 8, **characterized** in that the bar (8, 9) is a profiled bar with an L-shaped cross-section.

10 Device as defined in any one of claims 1 - 9, **characterized** in that the device comprises an alignment device (21) for the alignment of the device with respect to a plumb line / plumb lines.

11. Device as defined in claim 10, **characterized** in that the alignment device (21) and the bar (8, 9) comprise fastening elements (22) to allow the alignment device to be detachably fastened to the bar (8, 9).

12. Device as defined in claim 10 or 11, **characterized** in that the alignment device (21) comprises a directive member (23) having a straight edge (24) to be placed against the free straight edge of the second flange (17) of the bar (8, 9); and an alignment bar

(25) attached to the directive member (23) and extending to a distance from the bars in a direction substantially perpendicular to the longitudinal direction of the bars, said alignment bar being provided with an alignment mark (26), such as a notch, groove, line or the like, to allow the device to be aligned with respect to a plumb line (A, B).

13. Device as defined in any one of claims 1 - 12, **characterized** in that the front surface (7) of the guide rail (1, 2) is provided with a groove (27) oriented in the longitudinal direction of the guide rail; and that the device comprises a pointed element (28) located between the bars close to the end (I, II) of the device and having a point (29) shaped in a fashion corresponding to the cross-sectional form of the groove.

14. Device as defined in claim 13, **characterized** in that the pointed element (28) comprises two parallel stop faces (30, 31) facing in opposite directions, the distance between said stop faces, i.e. the thickness of the pointed element, substantially corresponding to the distance between the lateral guide surfaces (5, 6) of the guide rail (1, 2), so that when the side stop surfaces (12, 13) of the bars are pressed against the stop faces of the pointed element, they fasten the pointed element to the device.

15. Method for mounting the guide rails of a pair of elevator and/or counterweight guide rails in pairs in a vertical orientation so that the guide rails are at a distance from and parallel to each other using a device as defined in any one of claims 1 - 14, each of said guide rails (1 and 2) having a mounting flange (3) for attachment to a fixed structure and a guide flange (4) having two longitudinal lateral guide sur-

faces (5, 6) parallel to each other and facing toward opposite lateral directions and a front surface (7) extending between the lateral guide surfaces, and in which method the guide rails are aligned in a vertical direction by means of a plumb line / plumb lines and fastened to a fixed structure, **characterized** in that

a) the first guide rail (1) of the guide rail pair is aligned in a vertical direction by using a plumb line,

b) the first guide rail (1) is fastened to the fixed structure by its mounting flange (3),

c) the device is placed between the guide rails (1, 2) in a horizontal position so that the stop piece (10) at the first end (I) of the device rests against the front surface (7) of the first guide rail (1),

d) the side stop surfaces (12, 13) at the first end (I) of the device are tightly pressed against the lateral guide surfaces (5, 6) of the first guide rail (1) so that the device is fastened a horizontal position to the first guide rail (1),

e) the front surface (7) of the second guide rail (2) of the guide rail pair is placed against the stop piece (11) at the second end (II) of the device,

f) the side stop surfaces (12, 13) at the second end (II) of the device are tightly pressed against the lateral guide surfaces (5, 6) of the second guide rail (2) so that the second end (II) of the device is fastened to the second guide rail (2) and causes the second guide rail (2) to be oriented in a direction parallel to the first guide rail,

g) the second guide rail (2) is fastened to a fixed structure located near the device,

h) the pressure holding the device pressed against the guide rails is eased so as to leave a clearance between the side stop surfaces and the lateral guide surfaces of the guide rails to permit sliding,

i) the device is slid along the guide rails (1, 2) in a horizontal position to a level near the next point of attachment, and

j) steps a) - i) are repeated.

16. Method for mounting the guide rails of a pair of elevator and/or counterweight guide rails in pairs in a vertical orientation so that the guide rails are at a distance from and parallel to each other, using a device as defined in any one of claims 1 - 14, each of said guide rails (1 and 2) having a mounting flange (3) for attachment to a fixed structure and a guide flange (4) having two longitudinal lateral guide surfaces (5, 6) parallel to each other and facing toward opposite lateral directions and a front surface (7) extending between the lateral guide surfaces, and in which method the guide rails are aligned in a vertical direction by means of a plumb line / plumb lines and fastened to a fixed structure, **characterized** in that

k) the device is placed between the guide rails (1, 2) in a horizontal position so that the stop piece (10) at the first end (I) of the device rests against the front surface (7) of the first guide rail (1),

l) the side stop surfaces (12, 13) at the first end (I) are pressed tightly against the lateral guide surfaces (5, 6) of the first guide rail (1) so that the device is fastened in a horizontal position to the first guide rail (1),

m) the front surface (7) of the second guide rail (2) of the guide rail pair is placed against

the stop piece (11) at the second end (II) of the device,

n) the side stop surfaces (12, 13) at the second end (II) of the device are tightly pressed against the lateral guide surfaces (5, 6) of the second guide rail (2) so that the second end (II) of the device is fastened to the second guide rail (2), causing the second guide rail (2) to be oriented in a direction parallel to the first guide rail,

o) the assembly formed by the guide rail pair (1, 2) held together by the device is aligned by means of a plumb line / plumb lines disposed near it at a distance from each other,

p) the first guide rail (1) is fastened by its mounting flange (3) to the fixed structure,

q) the second guide rail (2) is fastened by its mounting flange to the fixed structure,

r) the pressure holding the device pressed against the guide rails is eased so that a clearance permitting sliding is left between the side stop surfaces of the device and the lateral guide surfaces of the guide rails,

s) the device is slid along the guide rails (1, 2) in a horizontal position to a level near the next point of attachment, and

t) steps k) - s) are repeated.

17. Method as defined in claim 15 or 16, **characterized** in that the device is aligned by means of the alignment device (21).

18. Method as defined in any one of claims 15 - 17, **characterized** in that the device is aligned by means of the pointed element (28).

19. Method as defined in any one of claims 15 - 18, **characterized** in that the device is adjusted to a horizontal position by using a spirit level.

20. Method as defined in any one of claims 15 - 19, **characterized** in that the device is moved in a horizontal position along the guide rails on top of a horizontal mounting platform.

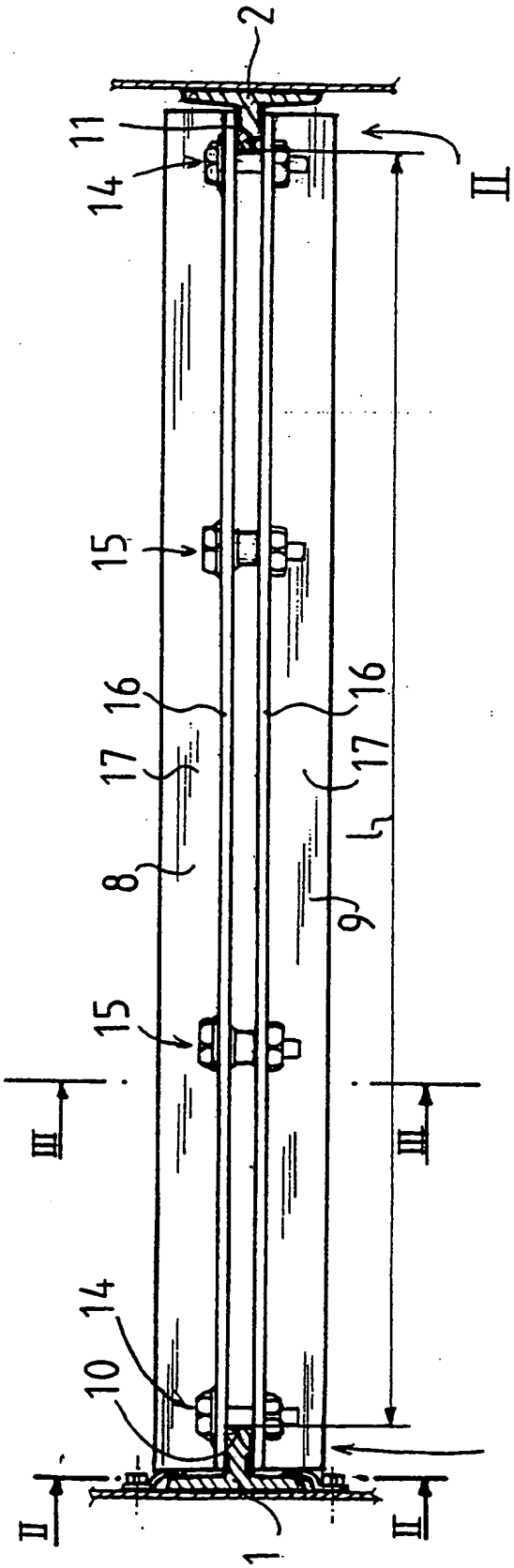


Fig 1

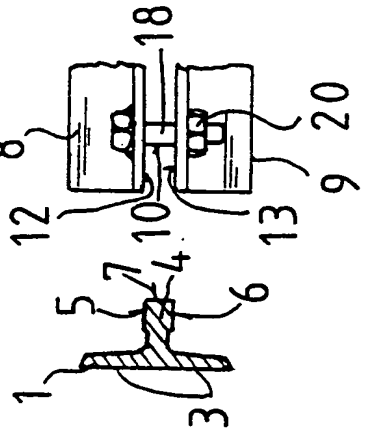


Fig 4

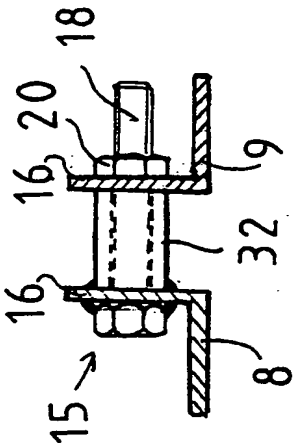


Fig 3

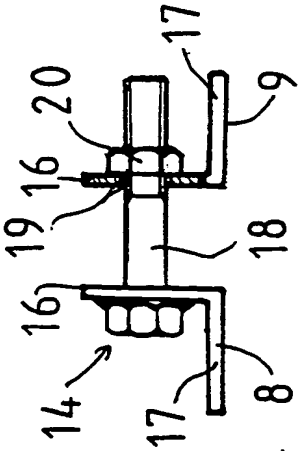
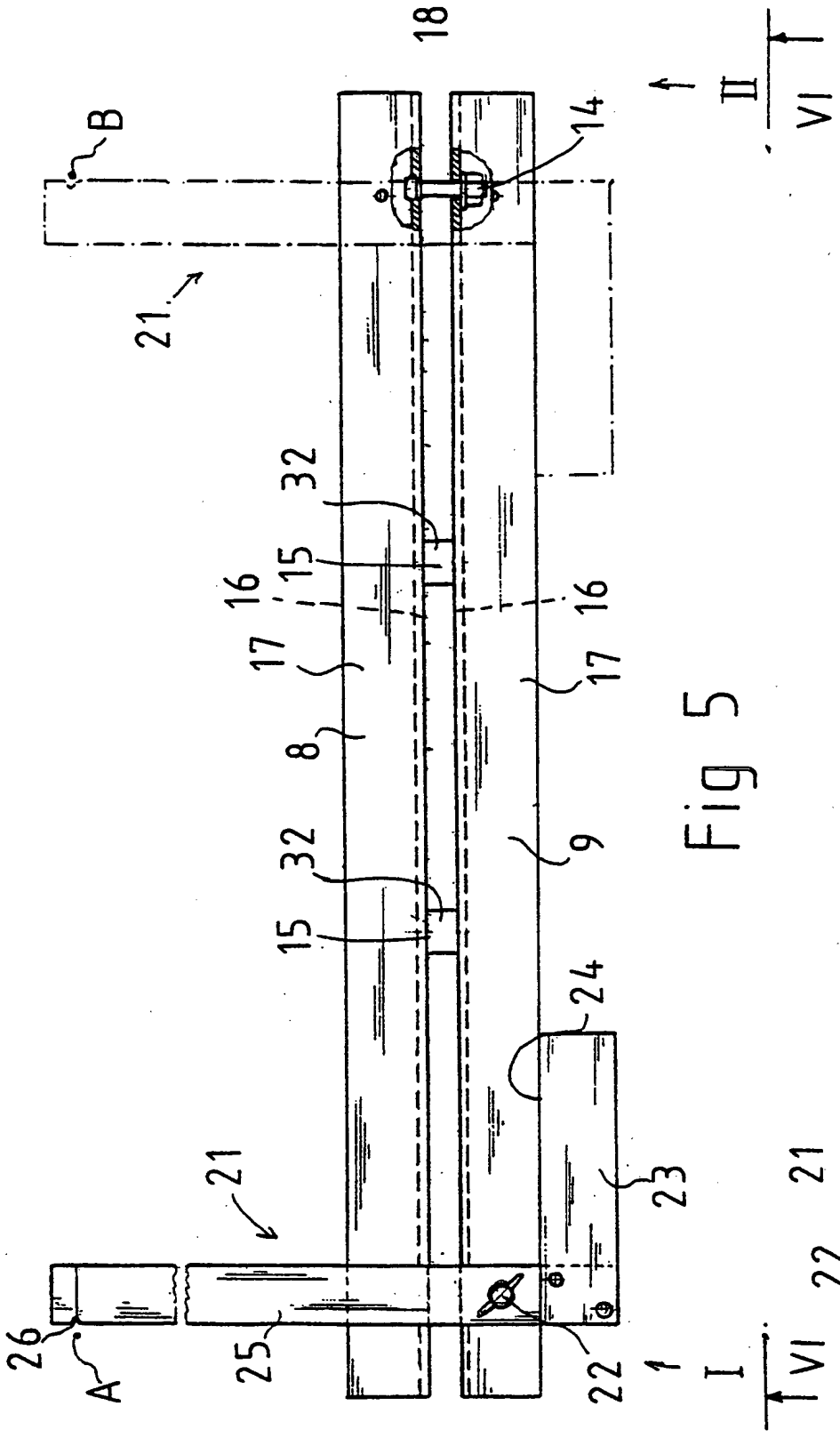


Fig 2


18
B
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II
VI
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A
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22
1
I
VI

Fig 5

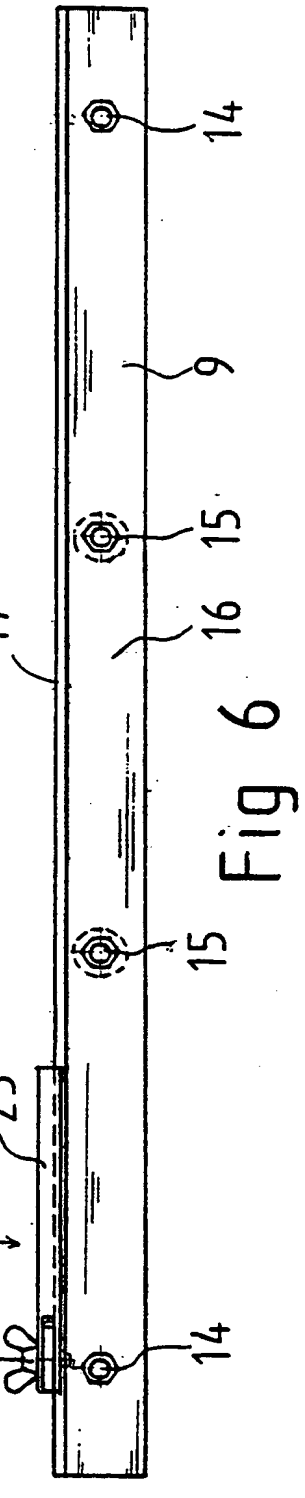
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Fig 6

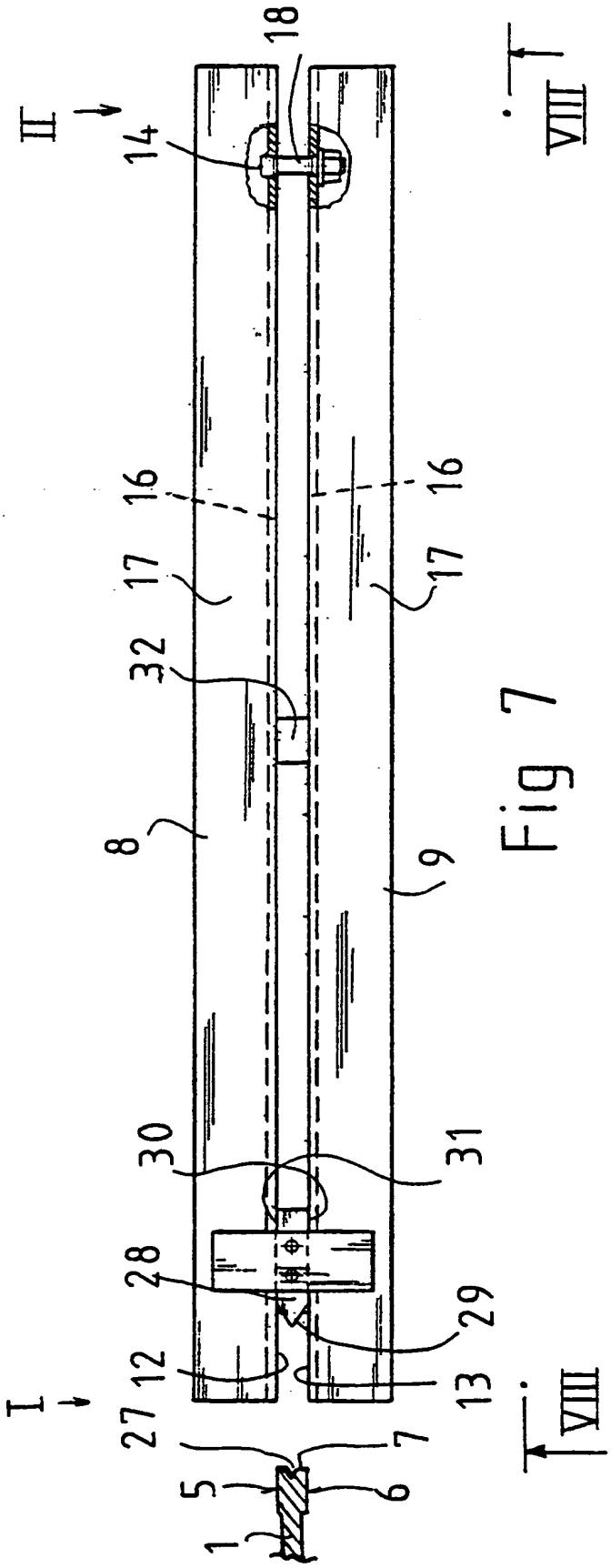
II
VIII
VIII
I
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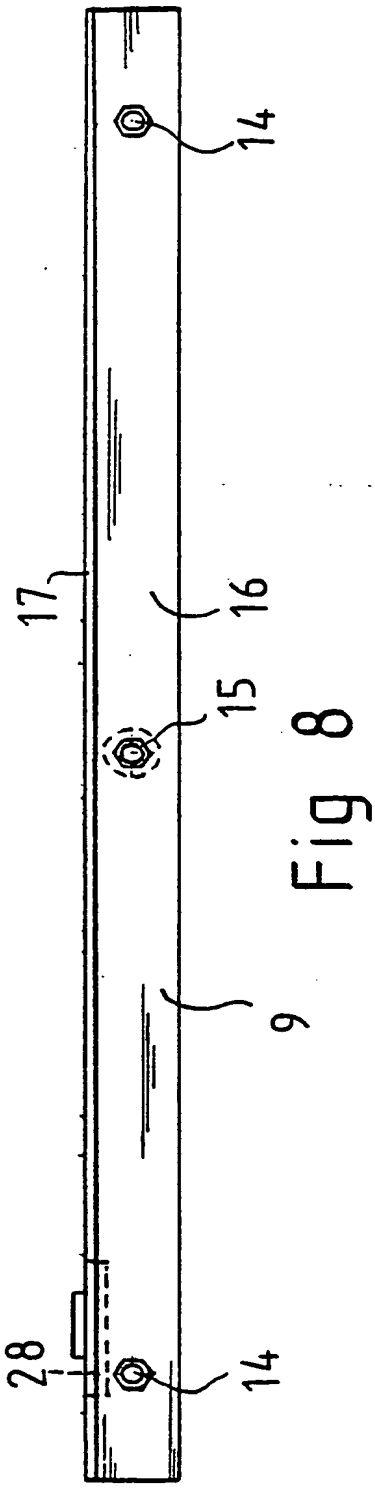
Fig 7


14
17
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14

Fig 8

INTERNATIONAL SEARCH REPORT

International Application No
PCT/FI 00/00083

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B66B7/02 //B66B19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DATABASE WPI Section PQ, Week 199620 Derwent Publications Ltd., London, GB; Class Q38, AN 1996-196397 XP002901020 & JP 08 067453 A (OTIS ELEVATOR CO), 12 March 1996 (1996-03-12) abstract ---	1,9,10, 15-17,19
A	DATABASE WPI Section PQ, Week 199721 Derwent Publications Ltd., London, GB; Class Q38, AN 1997-231015 XP002901021 & JP 09 071374 A (HITACHI BUILDING SYSTEM SERVICE KK), 18 March 1997 (1997-03-18) abstract; figures 1,2 --- -/--	1,10, 15-17,19

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 May 2000	21 06 2000

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

Inter 'tional Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 593 794 A (RUSSEAU RAYMOND J) 10 June 1986 (1986-06-10) column 1, line 57 -column 2, line 42; figures 5-7 -----	1,10-12, 15-17, 19,20

INTERNATIONAL SEARCH REPORT

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Inter ·lonal Application No
PCI/FI 00/00083

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 8067453 A	12-03-1996	NONE	
JP 9071374 A	18-03-1997	NONE	
US 4593794 A	10-06-1986	NONE	